tool, lens member 32 will expand to be held in place by annular member 30 and posterior capsule 10.

The components of this embodiment of the invention are shown to a larger scale in FIGS. 2 and 3. As is shown in FIG. 2, the outer periphery of annular member 30 has the form of an annular ring 40 which will be seated in the fornix between posterior capsule 10 and the remaining portions 12 of the anterior capsule. In the preferred embodiment, ring 40 has a larger cross section than planer section 48. Typically, member 30 has a diameter of 9.0 mm to 9.5 mm, while section 48 has a thickness of about 0.5 mm to 1.0 mm.

In one embodiment, member 30 is formed to present, adjacent its inner periphery, a transparent region 42 which is configured as a bifocal lens portion which will focus, or aid in focusing, on the retina, light rays entering the eye at angles which are offset from the optical axis of the ocular system. Region 42 may be configured to have a refractive power which varies. Either the entirety of member 30, or region 42, can be made of a transparent material.

The inner periphery 44 of member 30 is configured to mate with the contacting surface of lens member 32 when the latter is in its implanted condition. Therefore, the curvature of the anterior surface 46 of portion 42 will be selected in dependence on the curvature of surface 44 and the refractive power which region 42 is to have. It is desired that the curvature of section 46 and inner periphery 44 are selected such that lens 32 has +3 to +4 diopter power in region 42. In this manner, a blended bifocal is achieved

The diameter of annular member 30 is selected to correspond to that of the capsular bag, which, in most individuals is of the order of 9.5 mm. The diameter at the inner periphery of member 30, at the meeting line between surfaces 44 and 46, is preferably of the order of 3.5 mm.

As shown in FIG. 3, lens member 32 may have a conventional biconvex configuration and a diameter of the order of 3–4 mm. For implantation via an incision having a length of the order of 3 mm, this lens need be compressed by only a small amount. Lens member 32 may be made of silicone PMMA, or hydrogel. Other materials may be used, provided that they impart to lens member 32 the property of being at least slightly compressible and of automatically assuming the desired final shape after removal of the implantation tool. While lens 30 can be made as illustrated in FIG. 3, other configurations where the bifocal or other lens component is made part of the lens itself is also within the scope of this invention. In that regard, other lens configurations for lens 32 are illustrated in FIGS. 6 and 7. In FIG. 6, lens 32*a* is provided with an annular bifocal or other lens component 50, while in FIG. 7 lens 32*b* has bifocal or other lens component 52 in the form of a semicircular disc. Yet other lenses, such as Fresnel and aspherical, are also within the scope of this invention.

To further clarify the structure of the embodiment shown in FIGS. 2 and 3, a plan view thereof is shown in FIG. 4, which is to a smaller scale than FIGS. 2 and 3. In FIG. 4, the outline of lens member 32 is shown in broken lines, and the radial extent of region 42 is indicated. FIG. 4 particularly illustrates that annular ring 40 and region 42 are both continuous in the circumferential direction and are joined together by a solid, or continuous, annular portion 48 so that no openings or discontinuities exist between the inner and outer peripheries of member 30.

A second embodiment of the invention is illustrated in FIG. 5, this embodiment differing from that of FIGS. 2–4 only with respect to the configuration of annular member 30′ in the region of its inner periphery 44′. In the embodiment shown in FIG. 5, the inner periphery 44′ of annular member 30′ forms a groove, or pocket, enabling lens member 32 to be securely gripped at its periphery, and thus held in a defined position in chamber 24. More specifically, portions of the inner periphery 44′ of annular member 30′ mate with peripheral portions of the anterior and posterior surfaces of lens member 32. Here again, region 42′ adjacent inner periphery 44′ provide a lens portion having a higher lens power than the remainder of lens member 32 so as to form a bifocal lens. Also illustrated is the fact that a section 48′ of member 30′ can be formed to extend at an angle α=about 10° relative to the plane of the central part of member 30′ for ease of insertion. When member 30′ has the curved formed shown in broken lines in FIG. 5, it will be implanted in the eye with an orientation which places lens 32 closer to iris 6 (FIG. 1).

In each embodiment of the invention, the inner periphery of annular member 30, 30′ is configured to mate with the associated surface or surfaces of lens member 32 so that no gap is present between the two members and no fluid can seep therebetween.

For example, lens 32 can be made such that it expands into place. Alternately, it can be snap-fit into position, and can include means for firmly joining lens 32 to member 30, 30′ to help achieve firm fixation. As can be seen, member 30, 30′ covers the entire capsular bag. This helps reduce the liklihood of capsular opacification (cellular growth) in the posterior capsule. Further still, because member 30, 30′ is disc-shaped, a circular tension is applied to the bag. This can help reduce tears extension or wrinkles to the bag associated with many prior art devices.

While the description above refers to particular embodiments of the present invention, it will be understood that many modifications may be made without departing from the spirit thereof. For example, lens member 32 and annular member 30 can be configured without member 32 acting as a bifocal lens. Further, other means can be used to join lens member 32 to annular member 30, so as to still permit member 30 to be foldable and inserted through a very small incision, but without a need to fold the optical element 32. Further still, ring 40 can include other elements such as flexible hooks, support loops or the like to hold member 30 in proper position in the eye. Accordingly, the accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention.

The presently disclosed embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims, rather than the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed is:

1. An implantable intraocular lens assembly comprising:

a first member having an annular form, an outer periphery and an inner periphery delimiting an opening; and

a second member of transparent material having at least one curved surface and an outer periphery;